Space Weather Forecast

Issued on Monday, 01 April 2024 at 13:10 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Activity declining, with a decreasing chance of Moderate flares. Active to G1 Minor Storm intervals expected Day 3 (03 Apr) due to arrival of coronal hole fast winds.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Activity has been Moderate with a double peaked flare at 01/0132 UTC and at 01/0142 UTC. This appeared to be a dual flare, comprising components from a small region in the northwest and the large region now over the southwest limb. This large region has visible looping still just about evident on SDO imagery, as such any large flares from this region may still be observable. The only notable recent sunspot development on the Earth-side was the emergence of the small region near the northwest limb. Overall, it looks a fairly straightforward region, although its proximity to the limb means we are unable to see the finer detail in its magnetic structure.
No Earth-directed Coronal Mass Ejections (CMEs) were observed in available imagery.
Solar Wind / Geomagnetic Activity: Solar wind readings showed fast wind conditions, likely from two or more small coronal holes. Solar wind speeds were slightly elevated to elevated, mostly varying between 420-520 km/s. Total Interplanetary Magnetic Field (IMF) was weak to moderate, peaking between 31/2000-2400 UTC. The north-south component varied mostly weakly but with some moderate northward directed peaks. Geomagnetic activity was Quiet to Unsettled (Kp1-3) but with one Active (Kp4) interval 01/0600-0900 UTC.
Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Activity is expected to decline as the large sunspot rotates well onto the far-side with only smaller sunspot regions currently on the disc. There is a chance that any Moderate flares could still be observed from the Earth-side on Day 1 (01 Apr), but otherwise Low activity is most likely.
Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs, although this is only moderate confidence with a small chance of a glancing arrival on Day 2 (02 April) from a weak CME that left the Sun on 29 Mar. Otherwise current elevated wind speeds, due to coronal hole fast winds, are expected to gradually ease Days 1-2 (01-02 Apr). The next enhancement, from the combined influence two more larger coronal holes is then expected Day 3 (03 Apr) with any enhancement gradually easing from Day 4 (04 Apr).
Geomagnetic activity is forecast to be mainly Quiet on Days 1-2 with a slight chance of Unsettled to Active intervals from current fast wind or possible CME influence. Activity then increasing to be Active with G1 Minor Storm intervals due to the fast wind onset Day 3 and perhaps early Day 4, before easing to Quiet to Unsettled with a chance of Active intervals.
Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to be at background levels, but with a slight chance of enhancement above the S1/Minor Radiation storm level given any notable flares from the large sunspot around the southwest limb.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	5	50	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	25	10	20	20
Very Active	R3 to R5 X	No	5	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	15	10	5	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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